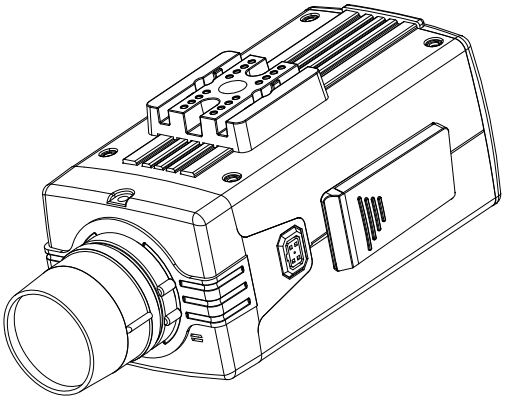
Car License Plate Camera (Effio WDR)

SHR-728



User Manual

Thanks for purchasing our product. Before operating the unit, please read the instructions carefully and keep this manual for future reference.

Safety Warning

⚠ **1. Read this manual carefully before installing the unit**

Please read this manual first for correct installation and operation.

⚠ **2. Never install the camera on a ceiling that cannot hold its weight**

The product may fall down and cause damages.

⚠ **3. Never install the camera near electric or magnetic fields**

Install the camera away from TV, radio transmitter, magnet, electric motor, transformer, audio speakers since the magnetic fields generate from above devices would distort the video image.

⚠ **4. Never install or use the camera in areas exposed to water, oil or gas**

The water, oil or gas may result in operation failure, electric shock or fire. Do not use this unit near water-for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, near a swimming pool, in an unprotected outdoor installation, or any area which is classified as a wet location.

⚠ **5. Never face the camera toward the sun**

Direct sunlight or severe ray may cause fatal damage to sensor and internal circuit.

⚠ **6. Power Cord Protection**

Touching the wet power cord with hands or touching the power cord with wet hands may result in electric shock. Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, playing particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.

⚠ **7. Attachments**

Do not use attachment not recommended by the product manufacturer as they may cause hazards.

⚠ **8. Object and Liquid Entry**

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind onto the product.

⚠ **9. Do not operate the camera in environments where the temperature, humidity or power source is beyond the specified ones**

Use the camera in suitable environments where the temperature is within -10°C~50°C and humidity below 80%. Use the input power source as this instruction indicated.

⚠ 10. Cleaning

Unplug the unit from the outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

⚠ 11. Never disassemble the camera nor put impurities in it

Disassembly or impurities may result in trouble or fire.

⚠ 12. Stop using when the product emits smoke or abnormal heat

⚠ 13. Servicing

Do not attempt to repair this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

⚠ 14. Retain Instructions

THE SAFETY AND OPERATING INSTRUCTIONS SHOULD BE RETAINED FOR FUTURE REFERENCE.

NOTE:

The information in this manual was current when published. The manufacturer reserves the right to revise and improve its products. All specifications are therefore subject to change without notice.

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1. Introduction

Built with Sony's latest Effio DSP and 1/3" 960H Double-speed CCD WD image sensor, SHR-728 has the capability of achieving resolutions of over 700TVL, the WDR function can produce clear and true image without noise even in tunnels, an environment with very strong light, and can capture vehicle license plate numbers at speed up to 200km/hr (125mile/hr) during the day, and 150km/hr (90mile/hr) at night.

The most exciting feature is the Multi-Shutter modes, Scheduled Shutter Mode, Manual Shutter Mode and Auto Shutter Mode. SHR-728 supports Balun RS-485 remote control to control the OSD remotely. When it comes to Car License Plate Camera, SHR-728 is definitely ideal to install at any kind of car entrances and exits for capturing car license plates.

1.1 Main Features

- 1/3" Hyper Wide Dynamic Car License Plate Camera (Effio WDR)
- 700TVL
- 0.03Lux@F1.2, Sense-up:0.0001Lux@F1.2
- Capable of Capturing Car License Plate Numbers at High Speed
  - Day:up to200km/hr (125mile/hr)
  - Night:up to150km/hr (90mile/hr), with External IR LEDs
- Self Defined Auto Shutter Speed Range
- Multi-Language OSD Control
- Powerful 510X WDR
- High Light Compensation (HLC)
- 2D/3D Noise Reduction
- Sense Up (512x) Functions
- Digital Image Stabilizer (DIS)
- E-zoom Function (1~256x)
- Advanced Motion Detection Function
- Quadrangle Mosaic Privacy Mask

1.2 Content List

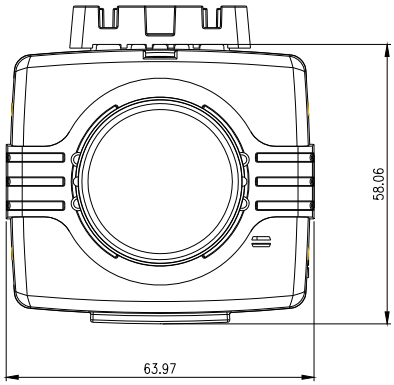
- Car License Plate Camera (EFFIO WDR): SHR-728
- User’s manual

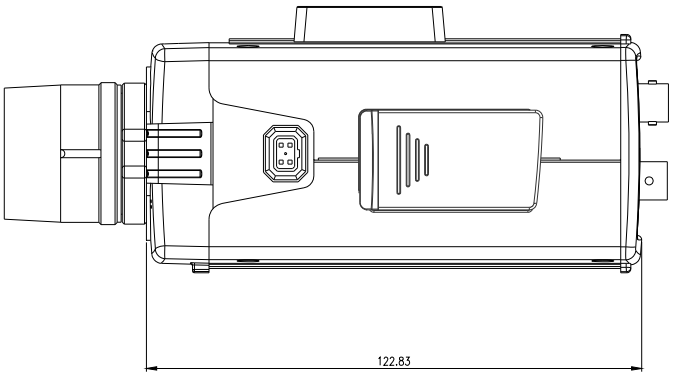
1.3 Specifications

TV System	PAL	NTSC
Image Sensor	1/3" Sony 960H EXview HAD CCD II	
Number of Total Pixels	1020(H)x596(V)	1020(H)x508(V)
Resolution	700TVL ; Sony Effio WDR	
Minimum Illumination	Color:0.03Lux@F1.2, B/W:0.005Lux@F1.2, Sense-up:0.0001Lux@F1.2	
Wide Dynamic Range	510x Normal Camera	
Video Output	1.0Vp-p Composite, 75Ω (BNCx2)	
Signal to Noise Ratio (S/N)	More than 55dB (AGC off)	
Gamma Correction	0.45	
Mechanical IR Cut Filter (ICR)	Automatically Switches (Switching Lux Level can be adjusted)	
IR LED ; Working Distance	Compatible with Infrared Illuminator	
Menu	OSD Control or by RS485 Control	
Title	TITLE (LOCATION)	
Synchronizing System	INTERNAL / LINE LOCK (for DC/AC and AC version)	
Digital Day&Night Mode	COLOR / B&W / AUTO / EXT	
Electronic Shutter	**Auto Shutter**: Self Defined Auto Shutter Speed Range (20 Steps) Programmable **Manual Shutter**: 20 Steps, 1/50(60), FL 1/120(100), 1/200, 1/250, 1/300, 1/350, 1/400, 1/450, 1/500, 1/600, 1/750, 1/1,000, 1/1,500,1/2,000, 1/3,000, 1/4,000, 1/10,000, 1/30,000, 1/60,000, 1/100,000 sec.	
Automatic Gain Control	0~200 Levels (Adjustable Level Settings)	
White Balance	ATW / AWB / PUSH LOCK / MANUAL / 3200K / 6300K / ANTI CR	
WDR ; BLC ; Fog Reduction	WDR / FOG REDUCTION / BLC / OFF	
High Light Compensation	ON / OFF / AUTO	
Flickerless	ON / OFF	
Dynamic Noise Reduction	3D / 2D	
Sense Up	AUTO (Limit x2~x512) / OFF	
Digital Image Stabilizer	ON / OFF	
Language	ENGLISH / TRADITIONAL CHINESE / SIMPLIFIED CHINESE	
E-Zoom	x1~x256, Pan / Tilt Adjustable	
Motion Detection ; Privacy	ON / OFF (24x16 Zones, Alarm) ; ON / OFF (15 Zones Programmable, Quadrangle Mosaic)	
Automatic IRIS ; Connector	VIDEO / DC ; D4 IRIS Jack	
Lens Mount	CS / C mount (With Adaptor Ring)	
Power Supply ; Consumption	12Vdc/24Vac (10.8~39Vdc/24Vac) ; 2.0W	
Operation ; Storage Temp.	-10°C~50°C ; -20°C~60°C	
Operation ; Storage Humidity	Maximum: RH80% ; RH90%	
Dimensions	64(W)×58(H)×123(L)mm	
Net Weight	350g	

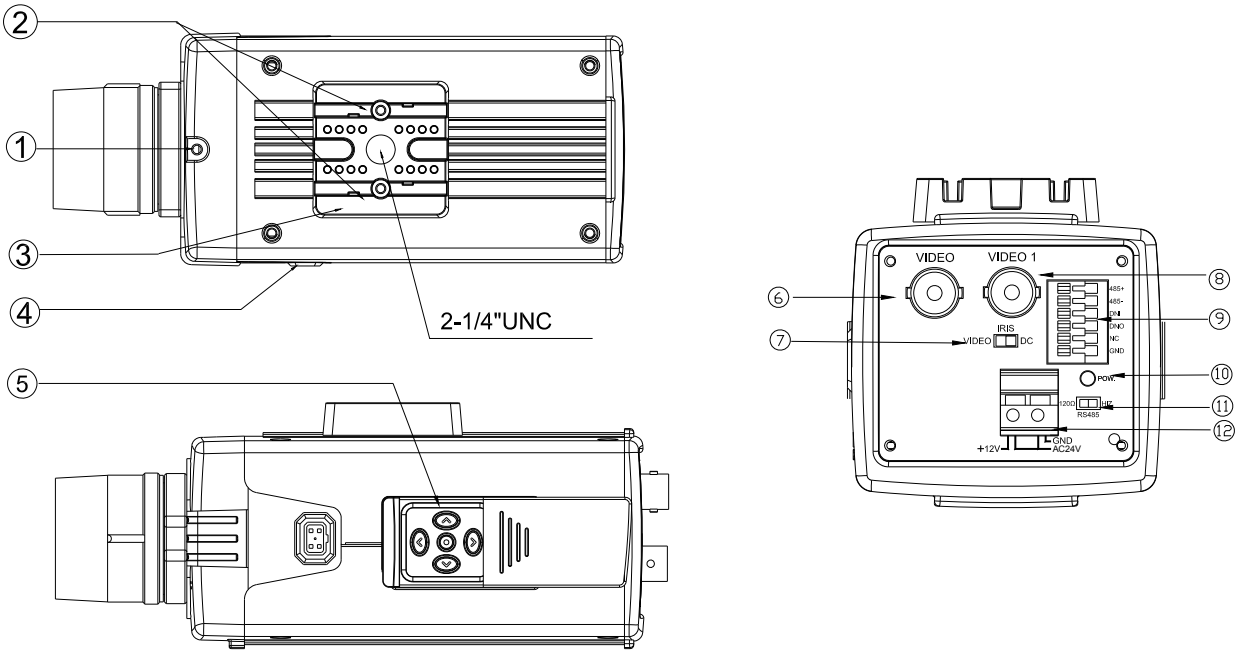
2. Camera Overview

2.1 Dimensions





2.2 Description of Camera Parts



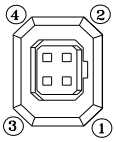
① **Lens Mount**
This mount is used to install a CS-mount lens. CS-adaptor ring is required when using a C mount lens.

② **Camera Mounting Screw Holes**
Screw holes for mounting the camera.

③ **Mount Adaptor**
The adaptor can be attached onto the top or the bottom of the unit.

④ **Auto Iris Lens Connector (4-pin type)**
The lens connector supplies the auto-iris lens (not supplied) with DC control signal.

PIN NO.	VIDEO	DC
1	DC + 12V	CONTROL -
2	NC	CONTROL +
3	IRIS	DRIVE +
4	GND	DRIVE -



⑤ **OSD Control Buttons**
ENTER button
UP & DOWN buttons
LEFT & RIGHT buttons

⑥ **Video Connector**
Video can be outputted via this connector. (75Ω).

⑦ **IRIS Mode Selection Switch**
Select DC or VIDEO mode according to the lens.

⑧ **Video Connector**
Video can be outputted via this connector. (75Ω).

⑨ **Communication Connectors**
1. RS485+
2. RS485-
3. Day & Night External Input (controlled by external infrared illuminator)
4. Day & Night Output
5. NC
6. Ground

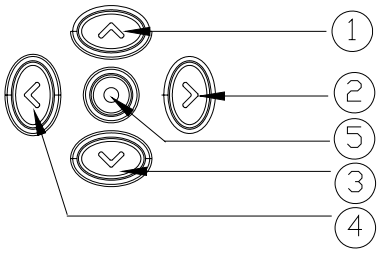
⑩ **Power Input Indicator Light**
When the camera is connected to a power supply, the indicator light will be on.

⑪ **RS-485 Terminal Impedance Switch**
Set the first and the last equipment terminal impedances as 120Ω and set the rest parallel connection equipment in the middle as HiZ to obtain the best transmitting status.

⑫ **Power Input Terminal**
Connect to the power supply.

3. OSD Operation

3.1 OSD Control Buttons



① **UP**
Use this button to move the cursor upwards to the desired item.

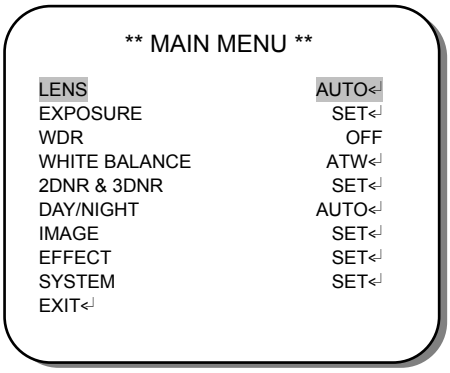
② **RIGHT**
Use this button to move the cursor to the right to select or to adjust the parameters of the selected item. The parameter increases when the right button is pressed.

③ **DOWN**
Use this button to move the cursor downwards to the desired item.

④ **LEFT**
Use this button to move the cursor to the left to select or to adjust the parameters of the selected item. The parameter decreases when the left button is pressed.

⑤ **ENTER**
Use this button to display the main menu, to confirm and to enter the submenus when they're available. Items with "↵" symbol in the end contain sub-menus. For further settings of those items, select the desired item with the button ▲ or ▼ and press the **ENTER** button to bring up the sub-menu and edit.

3.2 OSD Operation



1. Start to operate the OSD menu

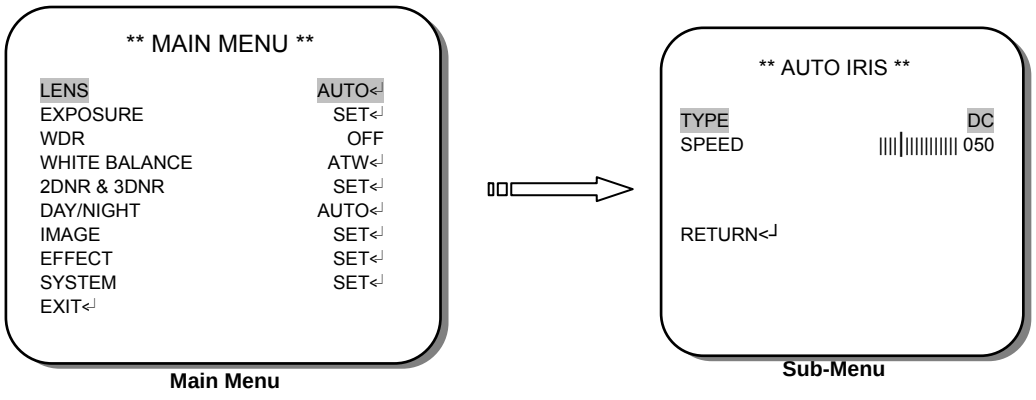
Press the **ENTER** button to bring up the OSD main menu to start operating OSD menus.

2. Select items with the cursor buttons

- Use buttons ▲ and ▼ to move the cursor up and down.
- Use buttons ◄ and ► to switch the modes or to adjust the parameters or the values of the settings.

3. Switch to the sub-menu

Items with "↵" symbol in the end contain sub-menus. For further settings of those items, select the desired item with the button ▲ or ▼ and press the **ENTER** button to bring up the sub-menu and edit.



Main Menu **Sub-Menu**

4. Return to the previous page

Select **RETURN** and press the **ENTER** button to return to the previous page.

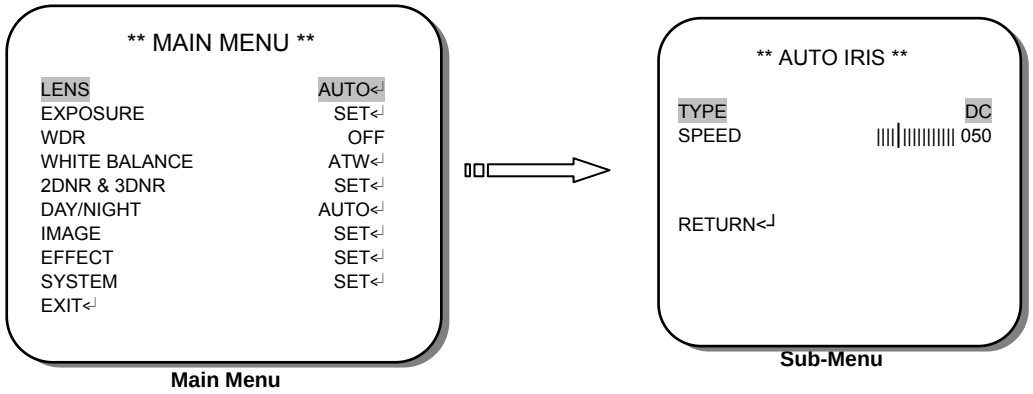
5. Exit the OSD menu

Select **EXIT** with the button ▲ or ▼ and press the **ENTER** button to exit the OSD menu.

4. Configuration

4.1 LENS

When the MAIN MENU is displayed on the screen, use the UP and DOWN buttons to the *LENS* and press the ENTER button to do further setups.



Main Menu **Sub-Menu**

TYPE

- When the DC LENS is in use, push IRIS SWITCH on the control board to DC, and the TYPE on the menu will be displayed as DC.
- When the VIDEO LENS is in use, push IRIS SWITCH on the control board to VIDEO, and the TYPE on the menu will be displayed as VIDEO.

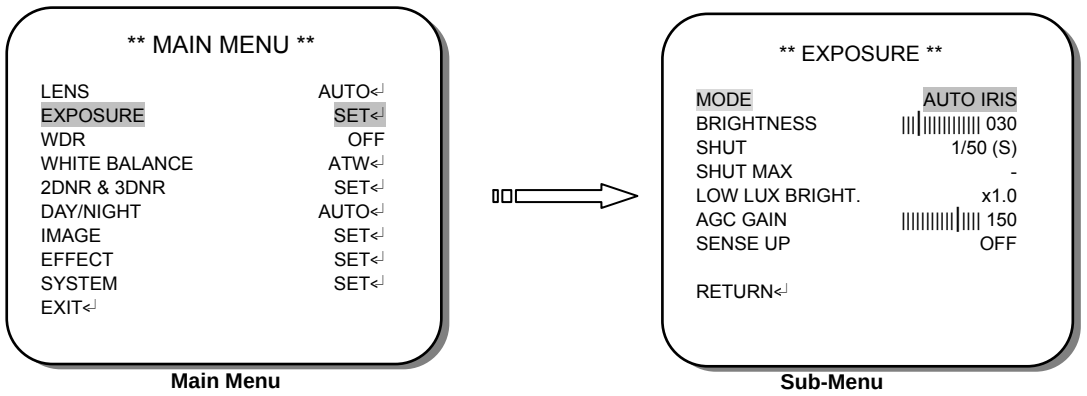
SPEED

The speed of DC Lens is in direct ratio to the number you set. The range of the SPEED can be set from 000~255.

NOTE:
The *SPEED* function will not work when the TYPE of LENS set to *VIDEO*.

4.2 EXPOSURE

When the MAIN MENU is displayed on the screen, use the UP and DOWN buttons to the *EXPOSURE* and press the ENTER button to do further setups.



Main Menu **Sub-Menu**

***MODE**

Two modes to select from: AUTO IRIS and SHUT+AUTO IRIS.

- When in AUTO IRIS mode, SHUT is activated and adjustable.
- When in SHUT+AUTO IRIS mode, SHUT MAX is activated and adjustable.

***BRIGHTNESS**

When the EXPOSURE MENU is displayed on the screen, use the UP and DOWN buttons to the *BRIGHTNESS* and use LEFT and RIGHT buttons to adjust the screen brightness from *000* to *255*.

***SHUT*(SHUTTER) / *SHUT MAX*(SHUTTER MAX)**

The shutter speed is in direct ratio to the number you set. The range of the shutter speed can be set from 1/50-1/100,000(sec).

***LOW LUX BRIGHT.* (LOW LUX BRIGHTNESS)**

Use LEFT and RIGHT buttons to adjust Low Lux Brightness. The options are *x0.25, x0.5, x0.75, x1.0*.

***AGC GAIN**

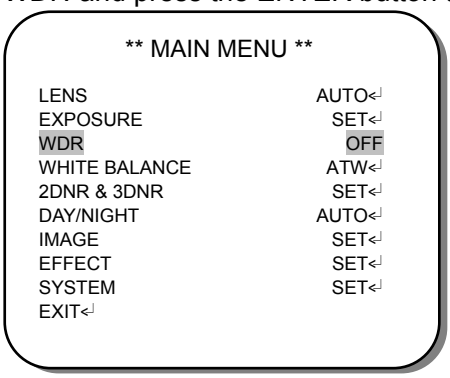
The bigger the number, the brighter the screen can be. Note that the noise will increase as well. The *AGC GAIN* range can be set from *000* to *200*.

***SENSE UP**

SENSE UP is used to maintain a brilliant, vivid screen image by automatically detecting changes in the level of light under low light level conditions. Select the desired item and press LEFT and RIGHT buttons to adjust the settings. The options are *x2, x4, x8, x16, x32, x64, x128, x256, x512*, and *OFF*.

4.3 WDR

1. When the MAIN MENU is displayed on the screen, use the UP and DOWN buttons to *WDR* and press the ENTER button to do further setups.

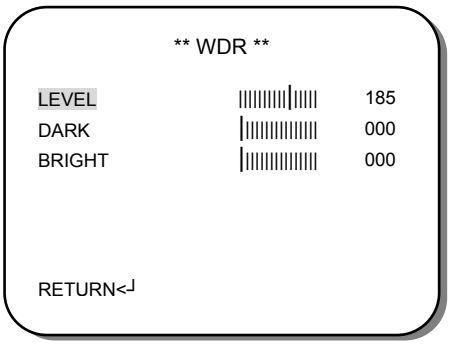


The modes under the function are: *WDR*, *BLC*, and *OFF.*

2. Please select the desired item and press LEFT and RIGHT buttons to adjust the settings.

***WDR (Wide Dynamic Range)**

When there are both bright and dark areas at the same time, selecting this mode makes both areas distinctive.



Sub-Menu under *WDR* mode.

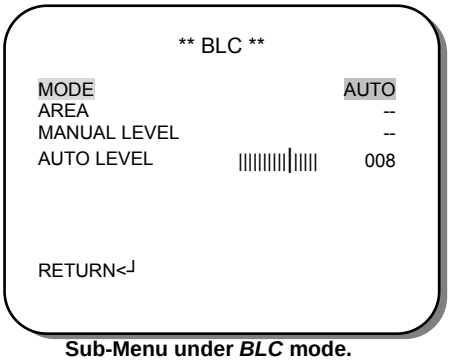
- ***LEVEL***
  Use the LEVEL function to adjust the brightness of the whole area.
  Level: *000~255*

- ***DARK***
  Use the DARK function to adjust the brightness of the dark area.
  Level: *000~255*

- ***BRIGHT***
  Use the BRIGHT function to adjust the brightness of the bright area.
  Level: *000~255*

***BLC* (Back Light Compensation)**

Even when there is a massive backlight behind the object, bright images of the background and the object can still be captured by selecting the *BLC* mode.



Sub-Menu under *BLC* mode.

The modes under the function are: *AUTO* and *MANUAL.*

- ***AUTO***
  Set AUTO LEVEL to adjust the BLC automatically. The range is *000~015*.
- ***MANUAL***
  Set AREA and MANUAL LEVEL to adjust the BLC value manually. The default AREA is *BOTTOM 1/3*, and the default LEVEL is *MID*. Stay with the default value, the bottom 1/3 area will be the brighter area, with the middle level of brightness.
  AREA: *BOTTOM 1/3*, *TOP 2/3*, *BOTTOM 2/3*, LEFT *2/3*, and *RIGHT 2/3.*
  MANUAL LEVEL: *HIGH*, *MID*, and *LOW.*

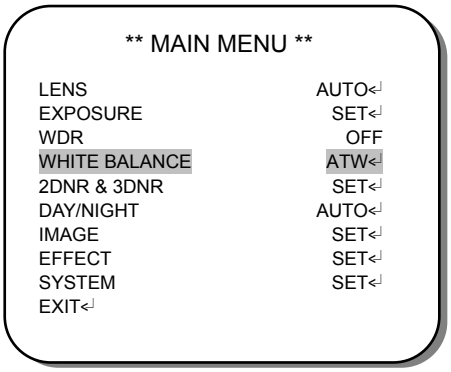
OFF

When set as *OFF*, there'll be no wide dynamic range.

4.4 WHITE BALANCE

The screen color can be adjusted by using the WHITE BALANCE function.

1. Please use the UP and DOWN buttons to *WHITE BALANCE* on the MAIN MENU and press the ENTER button to do further setups.
2. Please select the desired item and press LEFT and RIGHT buttons to adjust the settings.



The modes under the function are: *ATW, AWB, 3200K, 6300K, ANTI CR, MANUAL, and PUSH LOCK*.

******ATW* **(Auto Tracking White Balance)**

This mode can be used within the color temperature range from 1800°K to 10500°K (e.g., around fluorescent lights, outdoors, around sodium vapor lamps or inside tunnels).

******AWB* **(Auto White Balance)**

Select this to allow the camera automatically adjust the white balance under all conditions.

****3200K***

Select this when the color temperature is around 3200°K (when surrounded by sodium lights).

****6300K***

Select this when the color temperature is around 6300°K.

******ANTI CR* **(Color rolling suppression)**

Select to set the white balance mode to the ***ANTI CR*** mode.

Follow the instructions on the screen. Wait for a few seconds for the camera to set up. When completed, there will be a message displayed on the screen.

NOTE:

The ***White Balance*** can not fully function under the following conditions. When the following occurred, please select ***PUSH LOCK*** Mode.

- When there's a higher temperature surrounded the object.
- When there's darkness surrounded the object.
- When there's a fluorescent light surrounded the object or where the light changes all the time.

MANUAL

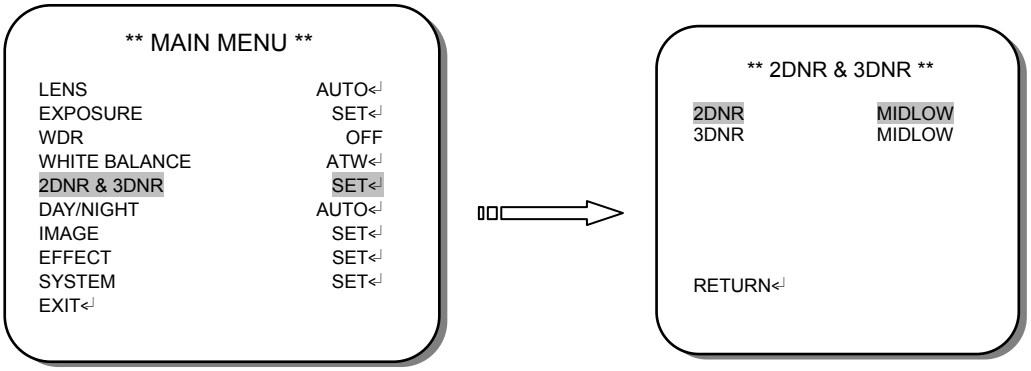
The manual adjustment mode enables a more precise adjustment. Increase and/or decrease the red and blue color values according to the color changes of the object to set the suitable color temperature.
RED color vale ranges from *000* to *255*.
BLUE color value ranges from *000* to *255*.

PUSH LOCK

Follow the instructions on the screen. Wait for a few seconds for the camera to set up. When completed, there will be a message displayed on the screen.

To find the optimal setting for the current luminance environment in this mode, point the camera towards a sheet of white paper and press the ENTER button. Whenever the condition changes, readjust it.

4.5 2DNR &3DNR (Dynamic Noise Reduction)



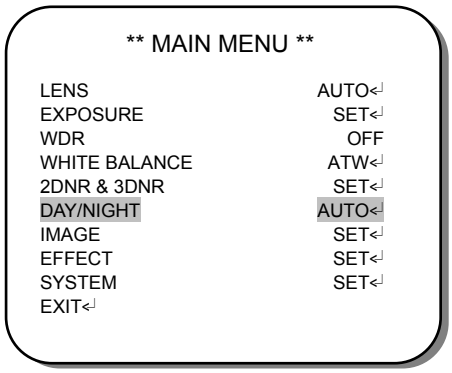
Sub-Menu under *2DNR & 3DNR* mode.

1. When the noise level is reduced, the camera performance can apparently be improved. When recording digitally, the image file size can be lessened by selecting the noise reduction. As the level of gain changes, the background noise in the low light level decreases automatically.
2. Please use the UP and DOWN buttons to 2*DNR & 3DNR* on the MAIN MENU and press the ENTER button to do further setups.
3. Please select the desired item and press LEFT and RIGHT buttons to adjust the settings.

4.6 DAY/NIGHT

The camera can be set in *Color* or *B/W* mode in the *Day/Night* function.

NOTE:
1. ***EXT*** function is **not** available for **OC** version.
2. Communication Connectors (including RS485) are **not** available for all cameras. Please refer to **2.2** for details.



The modes under the function are: *COLOR, B&W, AUTO, EXTERNAL*.

1. Please use the UP and DOWN buttons to *DAY/NIGHT* on the MAIN MENU and press the ENTER button to enter.
2. Please select the desired item and press LEFT and RIGHT buttons to adjust the settings.

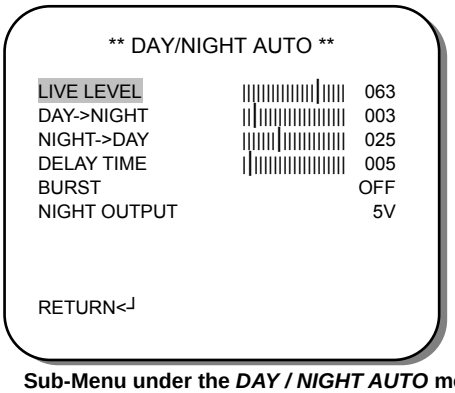
***COLOR**

The COLOR / DAY mode.

***B&W**

The BLACK & WHITE / NIGHT mode.

***AUTO**



Sub-Menu under the *DAY / NIGHT AUTO* mode

The camera will switch to *DAY/Color* mode or *NIGHT/B&W* mode according to the set value.

•*LIVE LEVEL*: This indicates the current light level.

•*DAY→NIGHT*: When the camera detects the current light level is lower than the set value, it'll switch from *DAY* mode to *NIGHT* mode. Value: 0~63.

•*NIGHT→DAY*: When the camera detects the current light level is higher than the set value, it'll switch from *NIGHT* mode to *DAY* mode. Value: 0~63.

NOTE:
1. The setting differences between DAY →NIGHT and NIGHT→DAY should be more than 5, or the camera will keep switching from DAY →NIGHT and NIGHT→DAY constantly.
2. The infrared illuminator is not recommended to use under *AUTO* mode. Please switch to *EXTERNAL* mode when an infrared illuminator is installed.

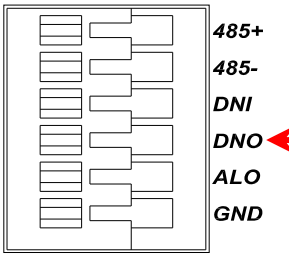
•*DELAY TIME:* Sometimes there's only a sudden and short light level change. Delay time can be set to avoid switching too fast. The camera will switch the mode after the set DELAY TIME passed. DELAY TIME can be set from 0 to 255 seconds.

•*BURST :* Turn the *BURST* function off to reduce the color noise under B&W mode. However, not every DVR machines can receive video signals without the color burst signals. If the camera cannot switch back to COLOR mode from B&W mode, please turn the BURST function on.

NOTE:
The *BURST* function is adjustable under *B&W*, *EXTERNAL* and *SCHEDULE* mode.

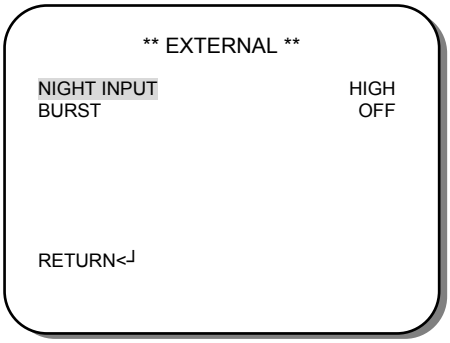
•*NIGHT OUTPUT*

OUTPUT / DNO / SYSTEM	**GND**	**5V**
COLOR	5V	GND
B&W	GND	5V



When the camera switches modes, the external components will be alerted, via DNO pin of the communication connector.

EXTERNAL



Sub-Menu under the *DAY / NIGHT EXTERNAL* mode

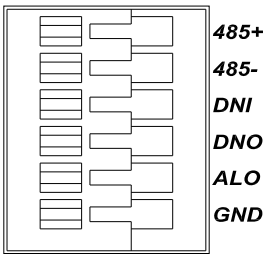
EXTERNAL mode allows the user to switch the DAY/NIGHT mode with external signals. For example, you can synchronize the DAY/NIGHT mode between the camera and the infrared LED illuminator.

For the camera with the light sensor, it is suggested to set the DAY/NIGHT mode to EXTERNAL to ensure the best result.

NIGHT INPUT: Select input level.
LOW : It will be the COLOR mode if the input signal is HIGH. On the contrary, it will be the B&W mode.
HIGH : It will be the B&W mode if the input signal is HIGH. On the contrary, it will be COLOR mode.

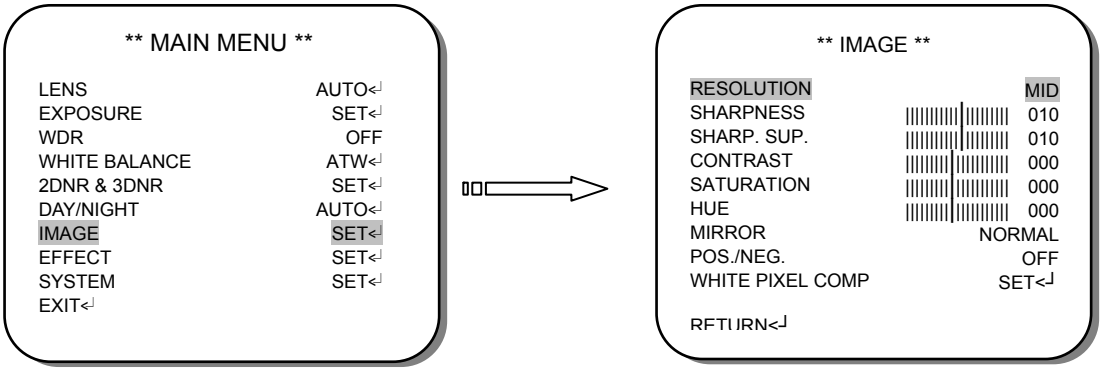
HIGH ：3~12V or OPEN
LOW ：GND

INPUT / SYSTEM / DNI	**LOW**	**HIGH**
HIGH	COLOR	B&W
LOW	B&W	COLOR



When the external infrared illuminator is in use, the camera can switch to COLOR or B/W mode, via DNI pin of the communication connector.

4.7 IMAGE



Sub-Menu under the Image Function

1. Please use the UP and DOWN buttons to *IMAGE* on the SETUP MENU and press ENTER button to enter.
2. Please select the desired item and press LEFT and RIGHT buttons to adjust the settings.

RESOLUTION

Options are *HIGH, MIDHIGH, MID, MIDLOW, LOW, and OFF.*

SHARPNESS

Level: *000~015*. The contour of the video image becomes cleaner and more distinguished as the level of SHARPNESS increases. If the level goes up extremely, it may affect the video image and cause noise.

***SHARP. SUP.* (SHARPNESS SUPPRESION)**

Level: *000~015*. *Select to adjust the value of the sharpness in low Lux environment.*

CONTRAST

Level: *-032~031 Select to adjust the value of the contrast.*

SATURATION

Level: *-050~050 Select to adjust the value of the gain.*

HUE

Level: *-050~050 Select to adjust the value of the hue.*

MIRROR

NORMAL, VERTICAL (vertical rotated), *MIRROR* (horizontal rotated), and *ROTATE* (vertical and horizontal rotated).

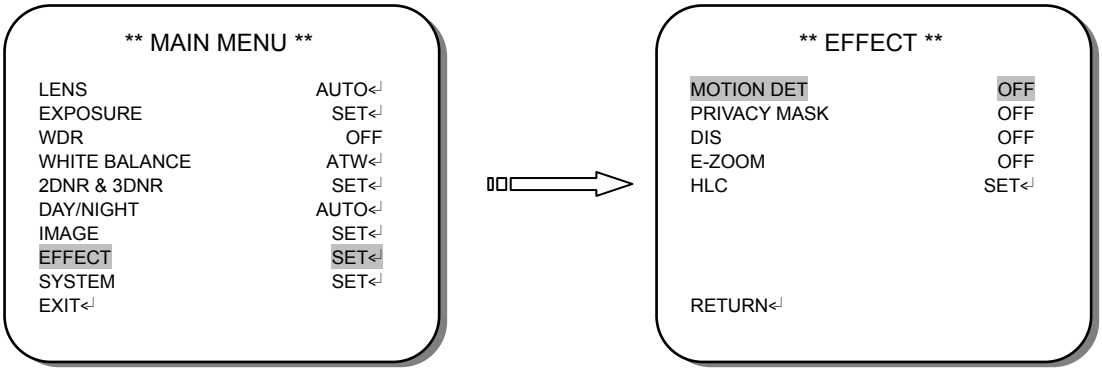
POS. / NEG.

ON/OFF. Positive/Negative Reversal. Select *ON* or *OFF* to enable or disable this function.

***WHITE PIXEL COMP* (WHITE PIXEL COMPENSATION)**

Level: *000~010*. Select to enter the sub-menu for further settings. Click START to search for the white pixels of CCD, and set MARKER to *ON* to display the pixels on the screen. Decrease the THRESHOLD value to find more white pixels, or increase the value to reduce the number of white pixels.

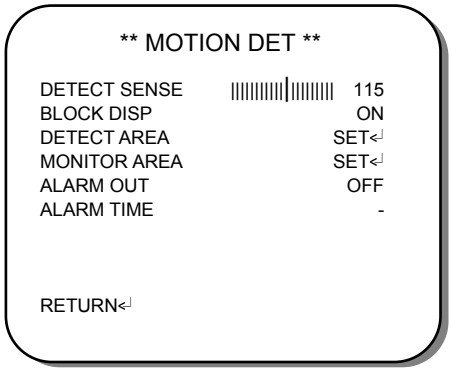
4.8 EFFECT



1. Please use the UP and DOWN buttons to *EFFECT* on the MAIN MENU and press ENTER button to enter.
2. Please select the desired item and press LEFT and RIGHT buttons to adjust the settings.

MOTION DETECTION

Options are ON/OFF. Set to *ON* and click ENTER to bring up submenu for further settings.



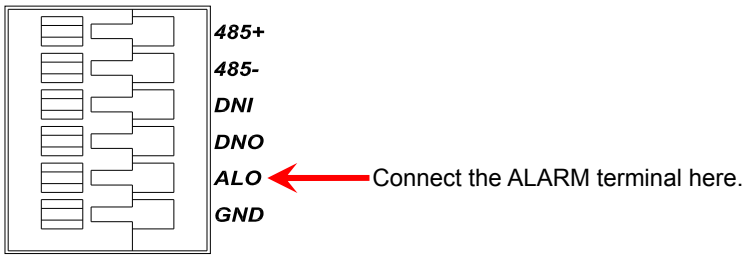
- ***DETECT SENSE***
  Sensitivity can be set from *0* to *127*. The higher the number, the more sensible the camera can be.

- ***BLOCK DISP***
  Set the block display to ON/OFF.

- ***DETECT AREA***
  Press SET to enter the sub-menu, and set the detect area.

- ***MONITOR AREA***
  Press SET to enter the sub-menu, and set the detect area.

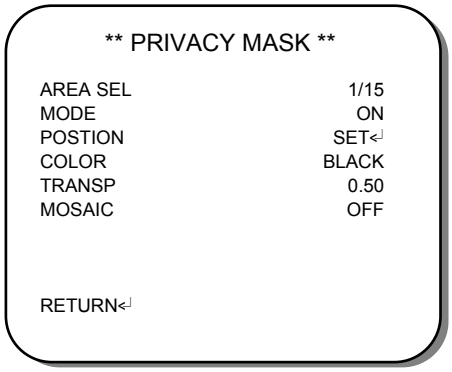
- ***ALARM OUT (Only available to cameras with Communication Connectors)***
  Choose *ON* to output the alarm; connect the alarm device to the ALO of the communication port on the rear panel so that the alarm can be output. Be sure to turn off all the power before connecting.



- ***ALARM TIME (Only available to cameras with Communication Connectors)***
  Alarm time can be set from *000* to *255* seconds.

****PRIVACY MASK***

Options are ON/OFF. Set to *ON* and click ENTER to bring up submenu for further settings.



- ***AREA SEL***
  There're *1-15* areas which can be masked.

- ***MODE***
  Options are ON/OFF. Choose *ON* to show the protected area on the screen, *OFF* to hide the protected area on the screen.

- ***POSITION***
  Press ENTER button for further settings. Adjust the area size and shape by dragging the vertices of the quadrilateral. Push ENTER to switch the vertices in the sequence of left top, right top, left bottom and right bottom, and push ENTER again to return to PRIVACY MASK submenu.

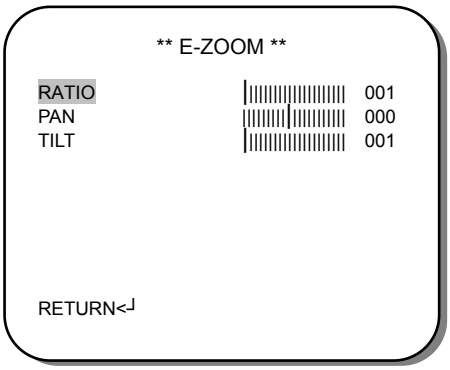
- ***COLOR***
  Use LEFT and RIGHT buttons to adjust the color of PRIVACY MASK. The options are *BLACK, RED, GREEN, BLUE, YELLOW, CYAN, MAGENTA* and *WHITE.*

- ***TRANSP***
  Use LEFT and RIGHT buttons to adjust the transparency of PRIVACY MASK. The options are *0.00, 0.50, 0.75* and *1.00. Note that the MOSAIC* will be disabled when the transparency set to *1.00*.
- ***MOSAIC***
  Options are ON/OFF. Use LEFT and RIGHT buttons to display the block in mosaic or not.

***DIS* (Digital Image Stabilizer)**

Options are *OFF* and *ON.* When set to *ON*, the DIS function will help to prevent vibration, and the E-Zoom function will be disabled.

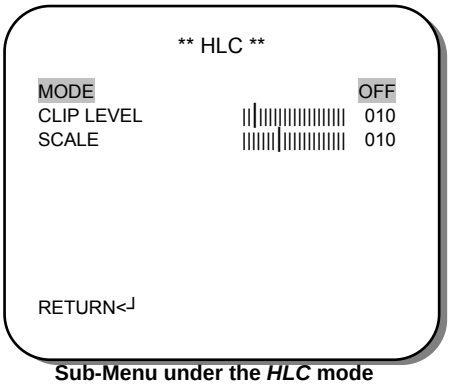
E-ZOOM



Sub-Menu under the *E-ZOOM* mode

Select *ON* and press ENTER button to do further setups.
Options are ***RATIO*** *001~256* (zoom in 1 to 256 times), ***PAN*** *-512~511* (horizontal zoomed-in viewing), and ***TILT*** *001~256* (vertical zoom-in viewing).

***HLC* (High Light Compensation)**



Sub-Menu under the *HLC* mode

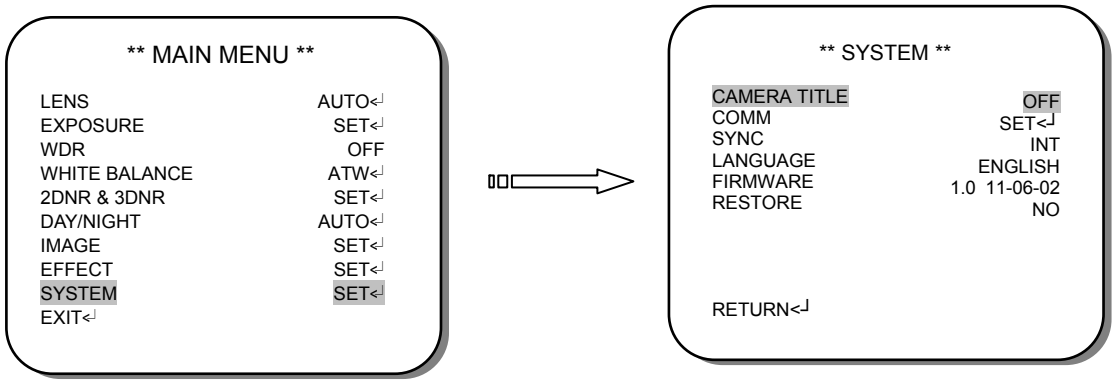
- ***MODE***
  Select to choose HLC mode from *OFF*, *ON*, and *AUTO*.

- ***CLIP LEVEL***
  Adjust the value of the HLC clip level from *000* to *255*.

- ***SCALE***
  Adjust the value of the HLC scale from *000* to *015*.

4.9 SYSTEM

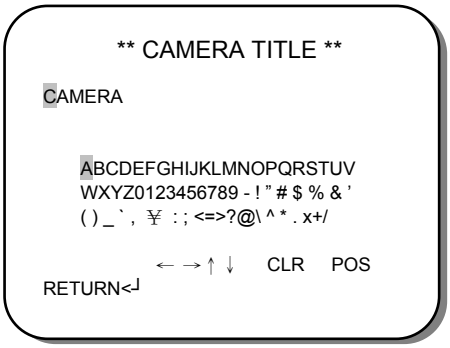
1. Please use the UP and DOWN buttons to *SYSTEM* on the MAIN MENU.



2. Please select the desired item and press LEFT and RIGHT buttons to adjust the settings.

NOTE:
The version of FIRMWARE shown on the above is for reference only. The actual version varies by the production.

CAMERA TITLE



- ← → ↑ ↓
  Select ←, →, ↑ or ↓ with the character selection cursor, and click the **ENTER** button to move the cursor in the direction of the arrow.

- ***CLR***
  Select to clear one letter of the input.

- ***POS***
  Adjust the position of the camera ID.

COMM

Select SET↵ to enter sub-menu for further settings.

1. The CAM ID, PROTOCOL and BAUD RATE will be displayed for the first five seconds on boot.

2. Changes made to the CAM ID, PROTOCOL and BAUD RATE will only take effect after you exit the COMM page. This is to prevent the camera from unexpected disconnecting caused by remote access.

•*CAMERA ID:* 1~1024

•*DISP CAM ID:* OFF/TOP-LEFT/TOP-RIGHT/BOTTOM-LEFT/BOTTOM-RIGHT. Select to hide the CAMERA ID or to adjust the CAM ID position.

•*BAUD RATE:* 2400/4800/9600/19200/38400

•*PROTOCOL:* PELCO D, PELCO-P

NOTE:
The *COMM* function is available for models with RS485 only.

***SYNC* (Only available to cameras with AC power input)**

Use the LEFT & RIGHT buttons to switch SYNC mode between *INT(Internal)* and *L.L.(Line Lock)*. Set to *L.L.* and click ENTER to bring up submenu for further settings.

LANGUAGE

Use the LEFT & RIGHT buttons to select the language preference.

The options are:

•*ENGLISH* •*简体中文* •*繁體中文*

FIRMWARE

Please refer to the actual firmware. (The figure shown on above is for reference only.)

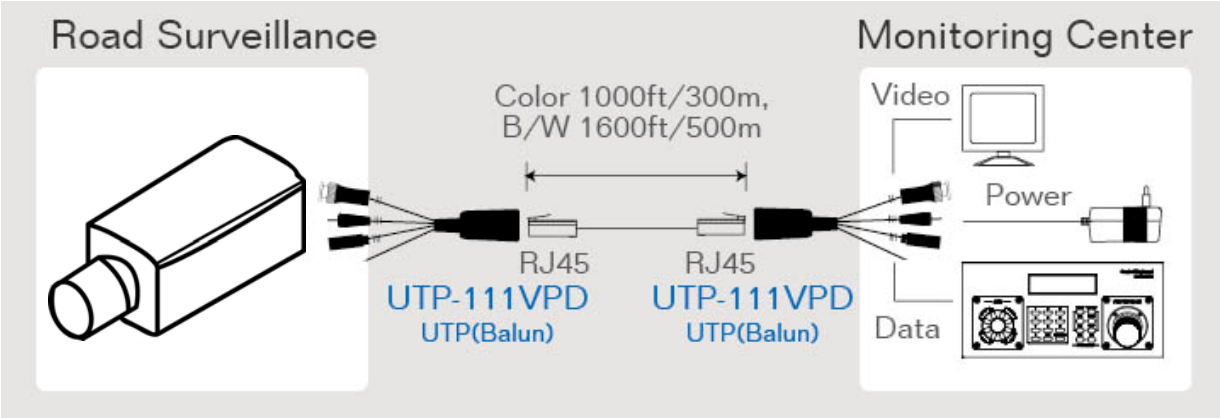
RESTORE

Select *NO* to exit, or select *YES* to restore all the settings to the defualt value.

NOTE:
The following items will not be restored: *CAM ID*, *PROTOCOL*, *BAUD RATE* and *LANGUAGE*.

4.10 Balun Function (UTP)

A Balun's function is available for **BOX** cameras only. It would normally require 3 terminals (Video + Power + RS485) to succeed a connection. However, via Balun, 1 is sufficient. The cameras OSD can be used and controlled remotely via RS485 communication port. The most important thing is transmission can still stay clear and true.



4.11 EXIT

Select EXIT to automatically save the settings made and exit the MENU.